Compact Pressure Switch

Series ZSE1 (For Vacuum)/ISE1 (For Positive Pressure)

For General Pneumatics

Can be integrated with ZM ejector system.

Variable hysteresis
1 to 10% of set pressure (Variable)

Easy and simple wiring
Connector type
Compact Pressure Switch
Series ZSE1/ISE1

How to Order

Rated pressure range/
Setting pressure range

Nil 0 to 1 MPa
L 0 to 100 kPa

Wiring specifications
Nil
L
C
CL
CN

Grommet type (Lead wire: 0.6 m)
Grommet type (Lead wire: 3 m)
Connector type (Lead wire: 0.6 m)
Connector type (Lead wire: 3 m)
Without connector

Positive pressure
ISE1

Vacuum
ZSE1

Piping specifications

| 00 | For mounting on ZM ejector |
| 01 | Single mounting R 1/8" Note 1 |
| T1 | Single mounting NPTF 1/8" Note 1 |

Note) When ordering switch with 5 m long lead wire, indicate both part numbers.
Ex.) ZSE1-01-15CN---1 pc.
     ZS-20-5A-50---1 pc.

Output specifications

14 NPN open collector 1 output
    w/o analog output, 3 turns adjustment
15 NPN open collector 1 output
    w/o analog output, 200 degrees adjustment
16 NPN open collector 2 output
    w/o analog output, 3 turns adjustment
17 NPN open collector 2 output
    w/o analog output, 200 degrees adjustment
18 NPN open collector 1 output
    w/analog output, 3 turns adjustment
19 NPN open collector 1 output
    w/analog output, 200 degrees adjustment
55 PNP open collector 1 output
    w/analog output, 200 degrees adjustment

Piping specifications

| 00 | For mounting on ZM ejector |
| 01 | Single mounting R 1/8" Note 2 |
| T1 | Single mounting NPTF 1/8" Note 2 |

Wiring specifications

| Nil | Grommet type (Lead wire: 0.6 m) |
| L   | Grommet type (Lead wire: 3 m)   |
| C   | Connector type (Lead wire: 0.6 m) |
| CL  | Connector type (Lead wire: 3 m) |
| CN  | Without connector               |

Without lead wire (Connector 1 pc., Socket 4 pcs.) ─ ZS-20-A
With lead wire .......................................................... ZS-20-SA-

With Connector/How to Order

Note)

Lead wire length

| Nil | 0.6 m |
| 30  | 3 m   |
| 50  | 5 m   |

Ex.) ZSE1-01-15CN---1 pc.
     ZS-20-5A-50---1 pc.
### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>ZSE1</th>
<th>ISE1L</th>
<th>ISE1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated pressure range/Set pressure range</td>
<td>For vacuum</td>
<td>For low pressure</td>
<td>For high pressure</td>
</tr>
<tr>
<td>For vacuum</td>
<td>0 to –101 kPa</td>
<td>0 to 100 kPa</td>
<td>0 to 1 MPa</td>
</tr>
<tr>
<td>For low pressure</td>
<td>–10 to 0 kPa</td>
<td>–10 to 0 kPa</td>
<td>–0.1 to 0 MPa</td>
</tr>
<tr>
<td>Proof pressure</td>
<td>500 kPa</td>
<td>1.5 MPa</td>
<td></td>
</tr>
<tr>
<td>Fluid</td>
<td>Air/Non-corrosive, non-flammable gas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>12 to 24 VDC ±10%, Ripple (P-P) 10% or less (With power supply polarity protection)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current consumption</td>
<td>1 output: 17 mA or less at 24 VDC, 2 output: 25 mA or less at 24 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response time</td>
<td>5 ms or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repeatability</td>
<td>±1% F.S. or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resistance</td>
<td>Enclosure: IP40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>Operating: 0 to 60°C, Stored: –10 to 60°C (With no condensation and no freezing)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating humidity range</td>
<td>Operating/Store: 35 to 85%RH (With no condensation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature characteristics (Based on 25°C)</td>
<td>±3% F.S. or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Withstand voltage</td>
<td>1000 VAC for 1 min. (between terminals and housing)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Port size</td>
<td>01: R 8, M5 x 0.8 T1: NPTF 1/8, M5 x 0.8 00: ZM ejector mount type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>40 g (Including 0.6 m-Long lead wire)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lead wire</td>
<td>Grommet type</td>
<td>Oilproof heavy-duty vinyl cable</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>–14, –15, –55 : 3 cores ø3.4, Conductor area: 0.2 mm², Insulator O.D.: 1.1 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>–16, –17, –18, –19: 4 cores ø3.5, Conductor area: 0.14 mm², Insulator O.D.: 1.0 mm</td>
<td></td>
</tr>
<tr>
<td>Connector type</td>
<td>Heat-resistant vinyl electric wire, 4-wire, Conductor area: 0.3 mm², Insulator O.D.: 1.55 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard</td>
<td>CE, RoHS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Output Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>-14</th>
<th>-15</th>
<th>-16</th>
<th>-17</th>
<th>-18</th>
<th>-19</th>
<th>-55</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch output</td>
<td>NPN open collector 30V, 80 mA or less</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residual voltage</td>
<td>1V or less (With load current of 80 mA)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of outputs</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hysteresis</td>
<td>1 to 10% of set prss. (Variable)</td>
<td>3% F.S. or less (Fixed)</td>
<td>1 to 10% of set prss. (Variable)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicator light</td>
<td>ON: when output is ON (Red)</td>
<td>ON: when output is ON (OUT1: Red, OUT2: Green)</td>
<td>ON: when output is ON (Red)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trimmer adjustment</td>
<td>3 turns 200 degrees</td>
<td>3 turns 200 degrees</td>
<td>3 turns 200 degrees</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analog output</td>
<td>None</td>
<td>None</td>
<td>1 to 5 V ±5% F.S. or less (At rated pressure range)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Analog Output

1 to 5 VDC

- **Rated pressure range**
  - A: 0 to –101 kPa
  - B: –101 kPa to 0 kPa
  - C: 0 kPa to 1 MPa

- **Pressure**
  - A: 0
  - B: 1
  - C: 5

- **Analog output**
  - A: 0
  - B: 1
  - C: 5

- **Output impedance**: Approx. 1 kΩ

- **Temperature characteristics (Based on 25°C)**
  - ±3% F.S. or less

- **Withstand voltage**
  - 1000 VAC for 1 min. (between terminals and housing)

- **Insulation resistance**
  - 50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing

- **Port size**
  - 01: R 8, M5 x 0.8 T1: NPTF 1/8, M5 x 0.8 00: ZM ejector mount type

- **Weight**
  - 40 g (Including 0.6 m-Long lead wire)

- **Lead wire**
  - Grommet type: Oilproof heavy-duty vinyl cable
  - –14, –15, –55: 3 cores ø3.4, Conductor area: 0.2 mm², Insulator O.D.: 1.1 mm
  - –16, –17, –18, –19: 4 cores ø3.5, Conductor area: 0.14 mm², Insulator O.D.: 1.0 mm

- **Connector type**
  - Heat-resistant vinyl electric wire, 4-wire, Conductor area: 0.3 mm², Insulator O.D.: 1.55 mm

- **Standard**
  - CE, RoHS

---

For details about the Pressure Switch Precautions, refer to pages 763 and 764. For details about the Specific Product Precautions, refer to the Operation Manual at SMC website. Click [here](#) for details.
Calibration Procedure

- Set the ON-pressure by the pressure setting trimmer. Turning clockwise can set the high pressure/high vacuum pressure.
- In the event of setting, use a flat head screwdriver suited for the grooves of a trimmer, and rotate it lightly with a fingertip.
- Switches with variable hysteresis can be adjusted by means of the HYS potentiometer in the range 1 to 10% of the setting pressure range.
- Readjust the ON-pressure setting when the hysteresis setting trimmer was changed after setting the ON pressure.

Hysteresis

Hysteresis is the pressure difference between the ON and the OFF pressure of the output signal. The set pressure is the pressure selected to switch from OFF to ON condition.

How to Use Connector

1. Attaching and detaching connectors
   - When assembling the connector to the switch housing, push the connector straight onto the pins until the lever locks into the housing slot.
   - When removing the connector from the switch housing, push the lever down to unlock it from the slot and then withdraw the connector straight off of the pin.

2. Crimping of lead wires and sockets
   Strip 3.2 to 3.7 mm at the end of the lead wires, insert the ends of the core wires evenly into the sockets, and then crimp with a crimping tool. When this is done, take care that the coverings of the lead wires do not enter the core wire crimping area.

3. Attaching and detaching lead wires with sockets
   - Attaching
     Insert the sockets into the square holes of the connector (with +, 1, 2, – indication), and continue to push the sockets all the way in until they lock by hooking into the seats in the connector. (When they are pushed in their hooks open and they are locked automatically.) Then confirm that they are locked by pulling lightly on the lead wires.
   - Detaching
     To detach a socket from a connector, pull out the lead wire while pressing the socket’s hook with a stick having a thin tip (about 1 mm). If the socket will be used again, first spread the hook outward.

Regarding the pressure setting

⚠️ Caution

Observe the following precautions for setting the vacuum pressure:
Use your fingertips to gently turn the screwdriver.
Do not use a screwdriver with a large grip or with a tip that does not fit into the trimmer groove because this could strip the groove.
Internal Circuits and Wiring Examples

- **-14/-15**
  NPN (1 output)
  - Brown DC (+)
  - Black OUT1
  - Blue DC (−)
  - Main circuit
  - Load
  - 12 to 24 VDC

- **-16/-17**
  NPN (2 outputs)
  - Brown DC (+)
  - Black OUT1
  - White OUT2
  - Blue DC (−)
  - Main circuit
  - Load
  - 12 to 24 VDC

- **-18/-19**
  NPN (1 output) + Analog voltage output
  - Brown DC (+)
  - Black OUT1
  - White OUT2
  - Blue DC (−)
  - Main circuit
  - Load
  - 12 to 24 VDC

- **-55**
  PNP (1 output)
  - Brown DC (+)
  - Black OUT1
  - Load
  - Blue DC (−)
  - 12 to 24 VDC
Series ZSE1/ISE1

Dimensions

Grommet type:
ZSE1-00-14/-15/-18/-19

Connector type:
ZSE1-00-14C/-15C/-18C/-19C

Grommet type:
⅞ SE1-01-16/-17

Connector type:
⅞ SE1-01-16C/-17C